

REMARKS

Claims 1 through 3, 5 through 18, and 20 through 23 are in the application, with Claims 1, 5, 9 through 13, 15 through 17, and 20 through 23 having been amended and with Claims 4 and 19 having been cancelled. Claims 1, 12, 13 and 17 are the independent claims herein. Applicants reserve the right to pursue the subject matter of previously-presented claims in this application and in other applications. No new matter has been added. Reconsideration and further examination are respectfully requested.

Claims 1 through 23 were rejected for obviousness-type double patenting over the claims of U.S. Patent No. 6,535,574 and over the claims of U.S. Patent Application Serial No. 10/051,088. While the propriety of these rejections is not conceded, Applicants currently intend to file Terminal Disclaimers to obviate the rejections once the present application is otherwise deemed to be in condition for allowance.

Claims 1 through 23 were rejected under 35 U.S.C. §102 as allegedly anticipated by U.S. Patent No. 6,405,072 to Cosman. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1 and 17

Amended independent Claim 1 relates to a method including acquisition of first three-dimensional surface data representing at least a portion of a patient's body while the patient is in a first position substantially maintained during a computed tomography scan, and acquisition of second data representing at least one internal three-dimensional portion of the patient's body while the patient is in the first position. The method also includes acquisition of third three-dimensional surface data representing at least the portion of the patient's body while the patient is in a second position, wherein the second position is substantially maintained in preparation for radiation treatment.

According to some embodiments, the foregoing features of Claim 1 may provide efficient verification of whether a patient position during radiation treatment corresponds to a position in which the patient was placed during a prior computed tomography (CT) scan. In this regard, data acquired during the prior CT scan may be used to determine a radiation treatment plan that

governs the radiation treatment. The above-mentioned verification may therefore assist in ensuring that the radiation treatment plan is delivered as intended.

Cosman is not seen to disclose the foregoing features of amended independent Claim 1. For example, Cosman is not seen to disclose at least acquisition of first three-dimensional surface data while a patient is in a first position substantially maintained during a computed tomography scan, and acquisition of third three-dimensional surface data representing at least the portion of the patient's body while the patient is in a second position substantially maintained in preparation for radiation treatment.

Each of the examples shown in Cosman includes determining a location of a target within a patient's body with respect to a device (e.g. LINAC machine L, image scanning apparatus 191). The location is determined by locating reference points on the surface of the patient with respect to the device. Next, the located reference points are correlated to previously-acquired scan data that indicates the position of the target with respect to the reference points.

Cosman does not describe any system to acquire three-dimensional surface data while a patient is in a first position and to acquire other three-dimensional surface data while the patient is in a second position. Therefore, Cosman does not disclose acquisition of first three-dimensional surface data while a patient is in a first position substantially maintained during a computed tomography scan, and acquisition of third three-dimensional surface data representing at least the portion of the patient's body while the patient is in a second position substantially maintained in preparation for radiation treatment.

Claim 1 is therefore believed to be in condition for allowance. Claim 17 relates to a medium storing controller-executable process steps that roughly correspond to the method of Claim 1. Claim 17 is therefore also believed to be allowable for at least those reasons presented above with respect to Claim 1. Withdrawal of the rejections of Claims 1, 17 and their respective dependent claims is therefore respectfully requested.

Claim 12

Independent Claim 12 relates to a method including acquisition of computed tomography data of a patient while the patient remains substantially in a first position, acquisition of first three-dimensional surface data of the patient while the patient remains substantially in the first position, and determination of a radiation treatment plan based on the computed tomography

data, the three-dimensional data, and data representing a physical layout of a radiation treatment station. The method further includes acquisition of second three-dimensional surface data of the patient while the patient remains substantially in a second position at the radiation treatment station, determination of whether the second three-dimensional data corresponds to the first three-dimensional data, and delivery of radiation to the patient according to the radiation treatment plan if it is determined that the second three-dimensional data corresponds to the first three-dimensional data.

According to some embodiments of amended independent Claim 12, a patient position during radiation treatment can be compared to a position in which the patient was placed during a prior CT scan. Moreover, a radiation treatment plan that governs the radiation treatment can be designed to ensure that the patient can in fact be placed in the position during radiation treatment without being impeded by structures of the radiation treatment station.

With regard to the specific claim language, Cosman is not seen to disclose at least the acquisition of first three-dimensional surface data of a patient while the patient remains substantially in a first position in which computed tomography data is also acquired, determination of a radiation treatment plan based on the computed tomography data, the three-dimensional surface data, and data representing a physical layout of a radiation treatment station, and acquisition of second three-dimensional surface data of the patient while the patient remains substantially in a second position at the radiation treatment station.

Cosman describes the determination of a location of a target within a patient's body with respect to a device. The determination proceeds by locating reference points on the surface of the patient and correlating the located reference points to previously-acquired scan data which indicates the position of the target with respect to the reference points. Cosman does not describe any system to acquire three-dimensional surface data while a patient is in a first position and to acquire other three-dimensional surface data while the patient is in a second position.

Consequently, Cosman cannot be seen to describe the acquisition of first three-dimensional surface data of a patient while the patient remains substantially in a first position in which computed tomography data is also acquired, and acquisition of second three-dimensional surface data of the patient while the patient remains substantially in a second position at a radiation treatment station. Moreover, nowhere does Cosman describe the determination of a

radiation treatment plan based on the computed tomography data, the three-dimensional surface data, and data representing a physical layout of the radiation treatment station.

Claim 12 is therefore believed to be in condition for allowance and withdrawal of the rejection thereof is respectfully requested.

Claim 13

Amended independent Claim 13 concerns a system which includes a computed tomography scanning device for acquiring computed tomography data of a patient while the patient is in a scanning position, a first surface photogrammetry device for acquiring first three-dimensional surface data of at least a portion of the patient's body while the patient is in the scanning position, a radiation treatment device for delivering radiation to the patient, and a second surface photogrammetry device for acquiring second three-dimensional surface data of at least the portion of the patient's body while the patient is in a treatment position on the radiation treatment device.

Nowhere is Cosman seen to disclose the foregoing features of amended independent Claim 13. In fact, each embodiment of Cosman describes a single device (i.e., LINAC machine L or image scanning apparatus 191) that is used in conjunction with one or more cameras. Accordingly, Cosman cannot be read to describe a system including a computed tomography scanning device, a first surface photogrammetry device, a radiation treatment device, and a second surface photogrammetry device, and in particular cannot be seen to describe such devices having the functions claimed in Claim 13. Claim 13 is therefore believed to be in condition for allowance, and withdrawal of the rejections thereof is respectfully requested.

CONCLUSION

The outstanding Office Action presents a number of characterizations regarding each of the applied references, some of which are not directly addressed herein because they are not related to the rejections of the independent claims. Applicants do not necessarily agree with the characterizations and reserves the right to further discuss those characterizations.

For at least the reasons given above, it is submitted that the entire application is in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience. Alternatively, if there remains any question regarding the present application or any of the cited references, or if the Examiner has any further suggestions for expediting allowance of the present application, the Examiner is cordially requested to contact the undersigned.

Respectfully submitted,

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Date



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